

NOTULAE AD FLORAM AGARICINAM NEERLANDICAM XXIX  
Two new species of *Psilocybe*

C. BAS & M.E. NOORDELOOS

Rijksherbarium / Hortus Botanicus, P.O.Box 9514, 2300 RA Leiden, The Netherlands

Two new species of *Psilocybe* (Basidiomycetes, Agaricales) are described from the Netherlands, viz. *P. puberula*, a bluing species similar to *P. semilanceata* and *P. cyanescens*, but clearly different by its dry cutis-like pileipellis with well-differentiated pileocystidia, and *P. flocculosa*, a member of section *Psilocybe* characterized by a floccose stipe and the presence of pleurocystidia.

During the revision of *Psilocybe* for the Flora agaricina neerlandica (Noordeloos, 1996, in prep.) two species of *Psilocybe* have been discovered that appear to be new to science. They are described in the present paper, which is dedicated to Marcel Bon because of his contribution to the knowledge of European agarics.

1. *Psilocybe puberula* Bas & Noordel., *spec. nov.* — Fig. 1, 2

Pileus 40–50 mm latus, conicus margine inflexus demum expansus, hygrophanus, margine translucido-striatus, obscure griseo-brunneus vel ater, in sicco sordide ochraceus centro obscuriore. Lamellae moderate confertae, liberae vel adnatae, ventricosae, stramineae demum fuliginosae vel griseo-brunneae violaceo tinctae. Stipes 20–70 × 1.2–3.5 mm, cylindraceus, apice pallide brunneus, basi obscure brunneus, apice pruinosis, versus basim ochraceo-fibrillosus. Odore saporeque rancido-farinaceo. Sporae 10.0–11.5(–12.0) × 6.0–7.0 × 7.0–8.0 µm, ellipsoideae vel oblongae, antice lentiformes, crassitunicatae, poro germinativo praeditus. Basidia tetrasporigera, fibulata. Cheilocystidia 10–35 × 4.5–11 × 1.0–3.0 µm, lageniformia. Pleurocystidia 15–30 × 7.0–12.5 × 1.5–3.5 µm, lageniformia. Pileipellis cutis hyphis cylindraceis, 2.0–7.0 µm latis constitutis. Pileocystidia abundantia, clavata, lageniformia, 15–55 × 3.0–12 µm. Stipitipellis cutis hyphis ad 20 µm latis. Caulocystidia abundantia, 16–80 × 7–20 µm, versiformia. Fibulae abundantes. Ad terram, gregarius.

Holotypus: The Netherlands, prov. Utrecht, Amersfoort, Leusderheide, 29 Oct. 1990, *J. Wisman* (L).

Pileus 40–50 mm broad, conical at first with involute to deflexed margin, expanding with age to (plano-)convex with weak, but distinct umbo and deflexed to straight margin, hygrophanous, very dark grey-brown when moist, with age becoming blackish (Mu. 10 YR 4–3/4 or even darker), translucently striate at margin, pallescent on drying to ochraceous buff (10 YR 7–8/6) with small, darker, grey-brown to dark ochraceous brown central spot, in two young specimens with slight bluish tinge when bruised, but no trace of blue seen in other specimens, lubricous when moist but not viscid, pellicle not easily peeling, smooth, under strong lens innately radially fibrillose, mat. Lamellae, L = 22–28, l = 1–3, moderately crowded, free, narrowly adnate or ascending, rather broadly ventricose, up to 6 mm broad, dull straw-coloured buff to pale chocolate-brown at first, soon

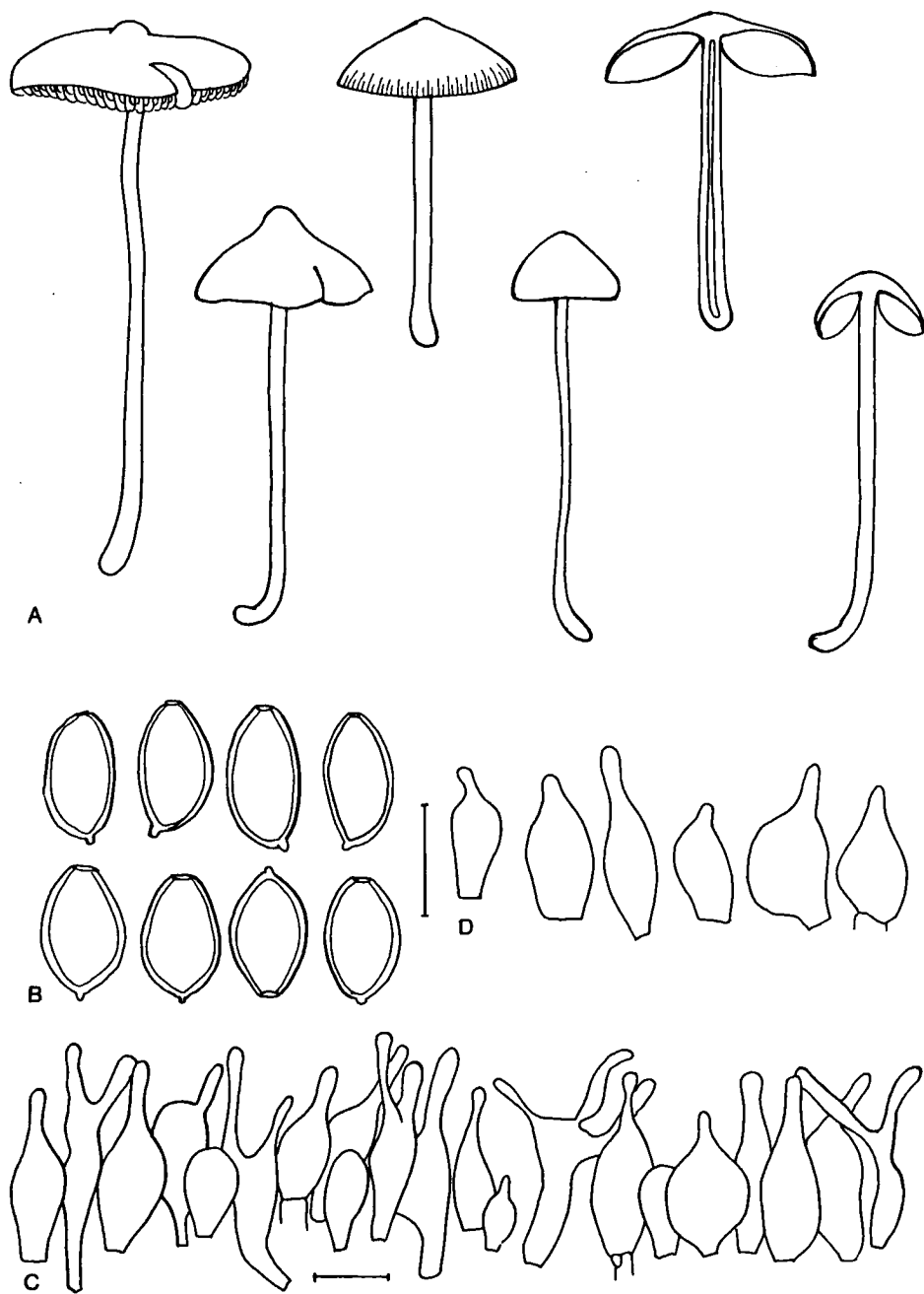


Fig. 1. *Psilocybe puberula*. A. Basidiocarps; B. spores; C. cheilocystidia; D. pleurocystidia. — Scale bars = 10  $\mu$ m.



Fig. 2. *Psilocybe puberula*. A. Elements of pileipellis; B. caulocystidia. – Scale bar = 10  $\mu$ m.

darker from ripening spores, finally dark grey-brown with violaceous tinge (first about 7.5 YR 3/2–4, then 10 YR 2–4/2–4), with conspicuous white edge. Stipe 20–70 × 1.2–3.5 mm, cylindrical, sometimes slightly enlarged at base, tough, stuffed to narrowly fistulous, very pale buff at apex, ochraceous buff in middle part, dark brown at base, darkening with age to dark red-brown or blackish brown, with pale pruinose covering at apex, downwards appressed fibrillose to strongly fibrillose at base with paler, isabella or ochre fibrils. Veil absent. Context thin and pale to dark brown in pileus, pallescent on drying to pale buff, in stipe pale yellow-brown in apical part, darker grey-orange to yellow-brown in middle part to blackish brown in base. Smell faint when fresh, somewhat sweetish-fungoid, strongly rancid-farinaceous when cut. Taste strongly rancid-farinaceous becoming somewhat bitter-astringent.

Spores 10.0–11.5(–12.0) × 6.0–7.0 × 7.0–8.0 µm, ellipsoid to oblong in side-view,  $Q = 1.4–1.7(–2.0)$ , av.  $Q = 1.5–1.6$ , oblong to ovoid or sublentiform in frontal view,  $Q = 1.3–1.6$ , av.  $Q = 1.4–1.5$ , with up to 1.5 µm thick wall and large central germ-pore, moderately dark brownish violaceous in water, olivaceous brown in ammonia. Basidia 15–20 × 6.0–9.0 µm, 4-spored, clamped. Lamella edge sterile. Cheilocystidia 10–35 × 4.5–11 × 1.0–3.0 µm, irregularly lageniform with narrow to rather broad basal part, neck sometimes forked, thin-walled, clamped. Pleurocystidia 15–30 × 7.0–12.5 × 1.5–3.5 µm, lageniform with broad basal part and relatively short neck, thin-walled, colourless, clamped, rather numerous. Hymenophoral trama regular to subregular, made up of slightly inflated, 6.0–30 µm wide elements. Pileipellis a cutis of 2.0–7.0 µm wide, cylindrical hyphae, sometimes with lateral projections, bearing numerous clavate, lageniform or irregularly shaped pileocystidia or cystidioid terminal elements, 15–55 × 3.0–12 µm; subpellis more or less distinct from underlying trama, made up of up to 35 µm wide, inflated elements. Pigment predominantly membranous, sometimes also faintly incrusting in pileipellis and upper pileitrama. Stipitipellis a cutis of up to 20 µm wide, cylindrical hyphae with slightly thickened, yellow walls. Caulocystidia abundant, 16–80 × 7–20 µm, very variably shaped from cylindrical to clavate, capitate to lageniform, with thin, colourless walls. Clamp-connections abundant.

Habitat & distribution – Saprotrophic, in groups at grassy road-side on poor, rather dry, sandy soil. Only known from type-locality.

*Collections examined.* The Netherlands, prov. Utrecht, Amersfoort, Leusderheide, 18 Oct. 1990 and 29 Oct. 1990 (holotype), J. Wisman (L).

*Psilocybe puberula* is a very distinct species because of the dry, not gelatinized pileipellis with pileocystidioid elements, the rather thick-walled spores, which are sometimes almost lentiform in frontal view, and the slight, but distinct bluing of the stipe and rarely also the pileus. *Psilocybe turficola* differs among other things by having larger spores, and sphagnicolous habitat. *Psilocybe sabulosa* Peck has a well-developed veil, larger spores (12–18.5 µm long), and differently shaped cheilocystidia. Both species lack pileocystidia. If one takes into consideration the slight bluing of the pileus in some specimens, sections *Semilanceatae* and *Cyanescens* also must be checked on similar taxa. *Psilocybe puberula* has some resemblance indeed with *P. strictipes* and *P. semilanceata*, which differ, however, by their distinctly gelatinized pileipellis without pileocystidia or pileocystidioid elements. *Psilocybe puberula* is not related to *P. cyanescens*, which always shows a very strong bluing, and has a very different, gelatinized pileipellis.

## 2. *Psilocybe flocculosa* Bas & Noordel., *spec. nov.* — Fig. 3

Pileus 5–9 mm latus, hygrophanus, rufo-brunneus, margine translucido-striatus, siccus, omnino subgranulosus. Lamellae confertae, subdecurrentae, pallide argillaceae. Stipes rufo-brunneus, omnino flocculoso-squamulosus, glabrescens. Sporae 6.0–7.0 × 3.5–4.0 × 4.5–6.0 μm, distincte lentiformae vel rhomboideae. Basidia 16–24 × 4–7 μm, 2- vel 4-sporigera, fibulata. Cheilocystidia 20–30 × 6–8 × 2–3 μm, lageniformia. Pleurocystidia abundantes, 20–30 × 8–11 × 3–4 μm, ventricoso-rostrata vel lageniformia. Pileipellis cutis vel trichoderma hyphae cylindraceae, 3.0–7.0 μm latae. Fibulae abundantes. Ad terram humosam in horto.

Holotypus: *J. Daams* s.n., 9 Sept. 1968, 'The Netherlands, prov. Noord Holland, 's-Gravenland, 'Boekensteijn' (L)'.

Pileus 5–9 mm, obtusely conical with involute margin, sometimes slightly umbonate, expanding to plano-convex or applanate, usually with slight depression around low, rounded umbo, hygrophanous, when moist dark red-brown at centre (Mu. 5 YR 3/2–4), with rather narrow, much paler ochraceous red to dark isabella marginal zone (5 YR 4/6, 7.5 YR 5/4, 10 YR 5/3), translucently striate at margin, dry, not viscid, entirely subgranulose, pallescent on drying, becoming minutely fibrillose-flocculose. Lamellae crowded, broadly adnate to subdecurrent, often secedent in expanded pilei, rather broad, triangular, up to 1.5 mm wide, pale clay-coloured when young (10 YR 6/3), then darker grey-brown with slight violaceous tinge (10 YR 5/3–7.5 YR 5/4), with white, granular edge. Stipe 9–17 × 0.3–1.5 mm, tapering towards base, reddish-ochraceous brown with dark red-brown base, finally almost black in basal part, at first entirely covered with pale reddish-ochraceous flocculose-squamulose covering, later on fibrillose, glabrescent. Context rather dark brown in pileus, concolorous with surface in stipe. Smell spontaneously weak, strongly subaromatic when crushed. Taste unpleasant, slightly bitter. Spore print dark purplish grey-brown (5 YR 3/3).

Spores 6.0–7.0 × 3.5–4.0 × 4.5–6.0 μm,  $Q = 1.4$ –1.8, av.  $Q = 1.6$ , ellipsoid to oblong in side-view,  $Q = 1.05$ –1.3, av.  $Q = 1.3$ , lentiform to rhomboid in frontal view, relatively thin-walled, with prominent germ-pore, brown in water. Basidia 16–24 × 4–7 μm, 2- and 4-spored, clamped. Lamella edge sterile. Cheilocystidia 20–30 × 6–8 × 2–3 μm, slenderly lageniform. Pleurocystidia abundant, 20–30 × 8–11 × 3–4 μm, ventricose-rostrate to lageniform, thin-walled, colourless. Hymenophoral trama subregular, made up of strongly inflated elements, 23–60(–80) × 4.0–12 μm, with finely incrustated walls. Pilei-

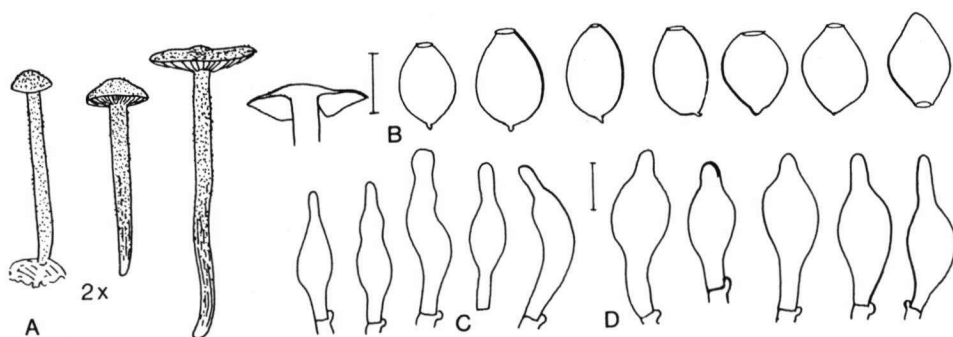


Fig. 3. *Psilocybe flocculosa*. A. Basidiocarps; B. spores; C. cheilocystidia; D. pleurocystidia. — Scale bars = 10 μm.

pellis a dry cutis with transitions to a trichoderm of cylindrical, often branched, 3–7  $\mu\text{m}$  wide hyphae. Pigment minutely incrusting and membranous in upper layer of pileus. Stipitipellis a cutis with trichodermal tufts of cylindrical, often strongly branched, up to 5.0  $\mu\text{m}$  wide hyphae with incrustated walls. Clamp-connections abundant.

Habitat & distribution – Saprotrophic, in large group on sandy soil mixed with compost and wood debris in orchard. Known only from type-locality.

*Collections examined.* The Netherlands, prov. Noord-Holland, 's-Gravenland, 'Boekensteyn', 9 Sept. 1968, J. Daams s.n., 15 Sept. 1968, J. Daams s.n. (holotype) & 15 Sept. 1968, E. Kits van Waveren (all in L).

*Psilocybe flocculosa* is well characterized by its flocculose pileus and stipe, presence and abundance of pleurocystidia, and strongly flattened spores with rhomboid frontal view. There exists no European species with this set of characters. Pleurocystidia only rarely occur in subgenus *Psilocybe*. Guzman (1983) accommodates species with pleurocystidia mainly in sect. *Singerianae* and sect. *Atrobrunneae*. *Psilocybe pallidisporea* (Murrill) A.H. Smith has similar pleurocystidia, but clearly differs by paler basidiocarps and not distinctly rhomboid spores; *P. laticystis* (Peck) A.H. Smith has much broader cheilocystidia, larger pleurocystidia, and less distinctly rhomboid spores.

#### ACKNOWLEDGEMENTS

We are very grateful to Mr. J. Wisman and Mr. J. Daams (†) for bringing these two species to our attention.

#### REFERENCES

- Guzman, G. 1983. The genus *Psilocybe*. Beih. Nova Hedwigia 74.  
Noordeloos, M.E. 1996 (in prep.). In: Bas et al. (eds.), Flora agaricina neerlandica, Strophariaceae, vol. 4, Balkema, Rotterdam/New York.